UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,058	04/06/2007	Lucile Gambut-Garel	1022702-000136	4269

21839 7590 04/29/2011

BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER	
SCULLY, STEVEN M	

ART UNIT	PAPER NUMBER
1727	

NOTIFICATION DATE	DELIVERY MODE
04/29/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com
offserv@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/553,058	GAMBUT-GAREL ET AL.	
	Examiner	Art Unit	
	Steven Scully	1727	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/17/2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

CROSSLINKABLE COMPOSITION FOR A BATTERY ELECTROLYTE

Examiner: Scully S.N.: 10/553,058

DETAILED ACTION

Specification

1. The Amendment filed February 17, 2011 has been entered. Claims 4 and 5 have each been amended to correct typographical errors. Support for the amendment is found on page 5, line 10 of the specification. Accordingly, claims 1-24 are pending in this application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Objections

3. Claim objection of claim 4 is withdrawn because the claim has been amended to correct the typographical error.

Claim Rejections - 35 USC § 103

4. Claims 1-24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Okada (US2002/0051911).

With respect to claim 1, Okada discloses a curable composition for a polymer electrolyte which comprises constituents (A) to (D) as an essential constituent, wherein (A) is a polysiloxane having a polyethylene oxide (polyoxyalkylene ether) structure-

containing group on a silicon atom and having two or more SiH groups, (B) is a compound having at least one structure selected from a siloxy linkage and having two or more alkenyl groups, (C) is a hydrosilylation catalyst, and (D) is an electrolyte salt compound. See abstract. A specific example of the constituent (B) is 1,3-divinyl-1,1,3,3-tetramethyldisiloxane, which is considered a polyorganosiloxane. See [0054].

Okada does not expressly disclose the SiH groups on the **(B)** compound or the alkenyl groups on the **(A)** compound as claimed (instead disclosing the opposite). However, the purpose of the SiH and alkenyl groups is to cross-link the polymers. Therefore, one of ordinary skill in the art at the time of the invention would recognize that the SiH groups of constituent (A) and the alkenyl groups of constituent (B) are substitutable for each other and would yield the predictable results of cross-linkable polymers that would, upon cross-linking, yield the same polymer. *KSR International Co. v. Teleflex Inc. (KSR),* 550 U.S. ___, 82 USPQ2d 1385 (2007).

With respect to claim 2, Okada molar ratio of constituent (A) to (B) of 0.05 to 3.0. See [0068]. Thus, the ratio of hydrogen atoms bonded to silicon to the number of alkenyl radicals would fall within the claimed range. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

With respect to claim 3, the polyoxyalkylene ether of the constituent (A) is, for example, a polyoxypropylene ether. See [0026-0027].

With respect to claims 4 and 5, Okada discloses the constituent (A) to have at least m repeat units, wherein m is greater than 1, of a polyethylene oxide structure-

containing group. R is shown to be a methyl group, Thus a=1. No X is present, c=0. the Y group is the polyoxyalkylene ether shown in the structural formula of paragraph [0026]. See [0026-0027]. In this case, the number of oxygens, (4-(a+b+c))/2, is equal to one. Okada discloses the Y group comprises R^1 which is $(CH_2)_3$. Specifically, the polyoxyalkylene ether is $(CH_2)_3(OCH_2CCH_2)_pOCH_3$. It is noted that the p group is an oxyethylene group (i.e. two carbons), which indicates that the additional "C" is a typographical error. This is further evidenced by the surrounding $O\text{-}CH_2\text{-}C\text{-}CH_2\text{–}O$ which is not chemically possible. It is the position of the Examiner that one of ordinary skill would recognize Okada intended the formula to be $(CH_2)_3(OCH_2CH_2)_pOCH_3$ which is chemically possible. In this case, p is an integer between 1 and 12. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

With respect to claims 6 and 7, Okada discloses the polyorganosiloxane as shown in the structural formula of paragraph [0026]. The R group comprises at least 2 hydrogens bonded to the silicon (i.e., at least 2 "o" integers as claimed). See [0027]. This, as discussed above with respect to claim 1, is considered to be substitutable with at least 2 alkenyl groups. Further, "m" is an integer of not less than 1, allowing at least 1 polyoxyalkylene ether (applicant's Y functional group).

With respect to claim 8, Okada specifically discloses vinyl, which the examiner believes would represent the claimed percentage under certain polymer conditions provided by Okada, while meeting the requirements of claim 6.

With respect to claims 9 and 10, Okada discloses 1,3-divinyl-1,1,3,3-tetramethyldisiloxane. See [0054]. As discussed above, the divinyl would be substitutable for hydrogen groups. This would represent the formula of claim 10 wherein p and q are 0 and the two end groups carry a hydrogen directly bonded to the silicon atom.

With respect to claims 11-14 and 16, Okada discloses the electrolyte to be $LiClO_4$, $LiPF_6$, $LiBF_4$, and so on. Se [0066].

With respect to claim 15, Okada discloses a 3.0-g portion of the polysiloxane obtained having a polyethylene oxide structure and a cyclic carbonate structure to be admixed with 3.4mmol of $LiCF_3SO_3$. Okada further discloses a wide range of possible structural formulas for the polyorganosiloxane. See [0026-0027]. It is the position of the Examiner that the O/Li ratio would fall within the claimed range. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

With respect to claims 17 and 18, Okada discloses the metal cation may be manganese, iron, cobalt, nickel, copper, zinc and silver. See [0065].

With respect to claims 19 and 20, Okada discloses the electrolyte may be an organic electrolyte such as propylene carbonate, and so forth. See [0070].

With respect to claim 21, Okada discloses the hydrosilylation catalyst (C) is based on platinum-vinylsiloxane, chloroplatinic acid, $Pt(COD)_2$ and the like. See [0059].

With respect to claims 22-24, Okada discloses a curable composition for a polymer electrolyte which comprises constituents (A) to (D) as an essential constituent,

wherein (A) is a polysiloxane having a polyethylene oxide (polyoxyalkylene) structure-containing group on a silicon atom and having two or more SiH groups, (B) is a compound having at least one structure selected from a siloxy linkage and having two or more alkenyl groups, (C) is a hydrosilylation catalyst, and (D) is an electrolyte salt compound. See abstract. A specific example of the constituent (B) is 1,3-divinyl-1,1,3,3-tetramethyldisiloxane, which is considered a polyorganosiloxane. See [0054].

Okada does not expressly disclose the SiH groups on the **(B)** compound or the alkenyl groups on the **(A)** compound as claimed (instead disclosing the opposite). However, the purpose of the SiH and alkenyl groups is to cross-link the polymers. Therefore, one of ordinary skill in the art at the time of the invention would recognize that the SiH groups of constituent (A) and the alkenyl groups of constituent (B) are substitutable for each other and would yield the predictable results of cross-linkable polymers that would, upon cross-linking, yield the same polymer. *KSR International Co. v. Teleflex Inc. (KSR),* 550 U.S. ___, 82 USPQ2d 1385 (2007).

This polymer electrolyte is then positioned between an anode and a cathode in a battery wherein the cathode consists of lithium metal, lithium alloys, inorganic materials with lithium therein, and so forth. See [0081-0084].

Response to Arguments

5. Applicant's arguments filed February 17, 2011 have been fully considered but they are not persuasive. Applicant argues:

a) There is nothing in Okada that teaches or suggests that constituent B is a polyorganosiloxane.

The Examiner respectfully disagrees. Particularly, the compound B is 1,3-divinyl-1,1,3,3-tetramethyldisiloxane. See [0054]. Referring to claim 10, this compound as discussed in the claim rejection where the divinyl groups are substitutable for hydrogen groups matches the general formula (IV) as required for the polyorganosiloxane (B) of claim 1, wherein p and q are 0 and the two end groups carry a hydrogen directly bonded to the silicon atom. Thus, it is the position of the Examiner that the compound meets the claimed limitations. Further arguments with respect to compound B being a polyorganosiloxane are similarly considered herein.

b) Okada further teaches that constituent (B) should not have any polyethylene oxide structure, In particular any polyalkyleneoxide.

The claim limitation requires that constituent (A) have the polyalkyleneoxide, of which Okada discloses. See [0040]. Regarding substitution, the polyalkyleneoxide is unrelated and would be maintained on the polyorganosiloxane A of Okada. Crosslinking occurs between the Si-divinyl groups and the Si-H groups, where the substitution is deemed obvious, as discussed above.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Scully whose telephone number is (571)270-5267. The examiner can normally be reached on Monday to Friday 7:30am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on (571)272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. S./
Examiner, Art Unit 1727

/Barbara L. Gilliam/
Supervisory Patent Examiner, Art Unit 1727